

REMARKS/ARGUMENTS

Claims 1-15 and 29-35 are pending, although claims 29-31 have been withdrawn from consideration. Upon indication of allowable subject matter, Applicants intend to seek rejoinder of the withdrawn claims as appropriate.

The Office Action also rejected claims 1-7, 9-11, 15 and 32-35 under 35 U.S.C. § 102 as anticipated by, or in the alternative, under 35 U.S.C. § 103 as obvious over U.S. patent application publication no. 2002/0155299 (“Harris”), claim 8 under 35 U.S.C. § 103 as obvious over Harris in view of U.S. patent application publication no. 2003/0082587 (“Seul”), and claims 12-14 under 35 U.S.C. § 103 as obvious over Harris in view of U.S. patent no. 6,060,178 (“Krisko”). In view of the following comments, Applicants respectfully request reconsideration and withdrawal of these rejections.

In making these rejections, the Office assumed that the applied art inherently disclosed the same type of coated substrate as the present invention: that is, the applied art inherently disclosed coated substrates where the dielectric layer has a crystallinity of greater than 90% and an RMS roughness of less than 1.5 nm, even if no exposure to at least one ion beam coming from an ion source occurred. Applicants respectfully submit that this assumption is incorrect and, therefore, that basing rejections on such an incorrect assumption is improper.

More specifically, exposing a dielectric layer to at least one ion beam coming from an ion source yields a different coated substrate than products which have not been exposed to such an ion beam. References submitted October 19, 2009, illustrate this point.

First, reference AZ explains that increasing crystallization is seen with Ion Beam Assisted Deposition. (See, section 3.1).

Second, reference AW explains the effect which Ion Beam Assisted Deposition has on RMS roughness. (See, section 3.2).

Together, these references demonstrate that exposure to at least one ion beam coming from an ion source improves crystallization and RMS roughness. Stated another way, these references demonstrate that coated substrates which have been exposed to at least one ion beam coming from an ion source have different crystallization and RMS roughness properties than other coated substrates which have not been exposed to such an ion beam.

Finally, reference AX (2002) concludes that the surface of ion beam assisted reactive magnetron sputtered titania films is smoother than that of conventional sputtered films, and that the crystal phase is amorphous. (See, conclusion section). Thus, reference AX teaches that the layer is not crystallized – it is amorphous. It does not teach or suggest the present invention which relates to improving crystallization and RMS roughness.

The present invention relates to a coated dielectric layer having a crystallinity of greater than 90% and an RMS roughness of less than 1.5 nm. Thus, the present invention provides for dielectric layers having good crystallinity and minimal roughness at the same time. As explained in the present application, such layers having such properties considerably improve the quality of, for example, epitaxially grown metal layers on such layers. (See, paragraph bridging pages 9-10). It is through exposure to at least one ion beam coming from an ion source, preferably a linear ion source, that the unique dielectric layers having the unique required properties are obtained. Nothing in any of the applied art teaches or suggests the claimed substrates having the required unique dielectric layer made by the required methods.

The Office Action recognized that none of the applied art teaches or suggests the required methods of obtaining the claimed coated substrates. To compensate for this deficiency, the Office Action asserted that the claims are product-by-process claims, meaning

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that the process limitations do not carry patentable weight. However, as explained above, the processes set forth in the claims result in unique products having unique characteristics.

In view of all of the above, Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. §103.

Applicants believe that the present application is in condition for allowance. Prompt and favorable consideration is earnestly solicited.

Respectfully submitted,

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